

Xiaowan Dam

The **Xiaowan Dam** ([simplified Chinese](#): 小湾坝; [traditional Chinese](#): 小灣壩; [pinyin](#): *Xiǎowān Bà*) is an [arch dam](#) on the [Lancang \(Mekong\) River](#) in [Nanjian County, Yunnan Province](#) in [southwest China](#). The primary purpose of the dam is [hydroelectric](#) power generation and it supports a 4,200 MW power station. Constructed between 2002 and 2010 by [Huaneng Power International](#) at a cost of [¥32 billion](#) (nearly [US\\$3.9 billion](#)), it is the world's second highest arch dam at 292 m (958 ft). It is also third highest among dams of all types behind [Jinping-I](#) and [Nurek](#) and the third largest hydroelectric power station in China. ^{[3][4][5][6]}

Background

The feasibility study for the dam was completed in 1992, with it as part of the Lancang River Project. In 1995 the report was reviewed and approved by the Chinese government. Three years later in 1998, a consortium to fund and construct the dam was organized. In 1999, preliminary construction (roads, bridges, river diversion) began. Official construction on the dam started on 1 January 2002. The river was diverted by November 2003 and concrete pouring began in 2005. The river diversion was closed and the reservoir began to impound in November 2007. ^[1] The first generator was commissioned in September 2009 and the dam was complete in March 2010. ^{[4][7]} The last of the six generators went operational on 22 August 2010. ^[8] The creation of the dam's reservoir submerged 55,678 ha (137,583 acres) of land and displaced 32,737 people. ^[1]

Specifications

The Xiaowan Dam is a 292 m (958 ft) tall and 902 m (2,959 ft) long double-curvature arch dam. Its crest is 13 m (43 ft) wide while the base sits at 69 m (226 ft) in width. The dam's crest is at an elevation of 1,245 m (4,085 ft) while the normal reservoir level is slightly lower at 1,240 m (4,068 ft). The dam's reservoir has a normal storage capacity of 15,043,000,000 m³ (12,196,000 acre·ft); of that capacity, 9,895,000,000 m³ (8,022,000 acre·ft) is active (or "useful") storage. The dam traps water from a [catchment area](#) covering 113,300 km² (43,700 sq mi). The surface of the reservoir at normal level covers 190 km² (73 sq mi). ^[1]


Helping to control floods, the dam has two spillways, 5 gates near the crest and a tunnel on the left bank. The gates can discharge up to 5,130 m³/s (181,164 cu ft/s) while the tunnel has a maximum discharge of 4,884 m³/s (172,477 cu ft/s). In the middle portion of the dam, there are six orifice openings that can discharge 6,500 m³/s (229,545 cu ft/s). In addition, the dam can release


additional water and sediment with two bottom outlets. All of the dam's outlets including the power station give it a maximum flood discharge of 20,709 m³/s (731,331 cu ft/s).^[1]


On the right bank of the dam is the power station intake which receives water into six 9.6 m (31 ft) diameter **penstocks** which each feed a 700 MW **Francis turbine**-turbine in the **underground power station**. The drop in elevation from the intake to the turbine affords a maximum **hydraulic head** of 251 m (823 ft). Once discharged by the turbine, the water is sent down one of two 18 m (59 ft) diameter tailrace tunnels towards the river.^[1]

See also

- List of power stations in China
- List of tallest dams in the world
- List of tallest dams in China
- List of dams and reservoirs in China

[China portal](#)

[Water portal](#)

[Renewable energy portal](#)

References

1.

"Xiaowan" (<https://web.archive.org/web/20120426084313/http://slx.zjwchc.com/sdz/sdz1/8.htm>) (in Chinese). China Water Conservancy and Hydropower Construction Group Company. Archived from [the original](http://slx.zjwchc.com/sdz/sdz1/8.htm) (<http://slx.zjwchc.com/sdz/sdz1/8.htm>) on 26 April 2012. Retrieved 1 January 2012.

2.

"Xiaowan" (<http://www.chincold.org.cn/dam/s/rootfiles/2010/07/20/1279253974169481-1279253974171370.pdf>) (PDF). Chinese

Xiaowan Dam	
<div><div><div></div></div><div><div></div></div></div> <div>Location of Xiaowan Dam in China</div>	
Official name	小湾坝
Coordinates	24°42′11″N 100°05′31″E﻿ (https://geohack.toolforge.org/geohack.php?page_name=Xiaowan_Dam&params=24_42_11_N_100_05_31_E_type:landmark)
Status	Operational
Construction began	1 January 2002
Opening date	March 2010
Construction cost	 US\$ 3.9 billion
Dam and spillways	
Type of dam	Arch, double-curvature
Height	292 m (958 ft)
Length	902 m (2,959 ft)
Elevation at crest	1,245 m (4,085 ft)
Width (crest)	13 m (43 ft)
Width (base)	69 m (226 ft) ^[1]

National Committee on Large Dams.
Retrieved 1 January 2012.

3. "China becomes hydro superpower" (http://www.chinadaily.com.cn/business/2010-08/26/content_11204360.htm) .
4. "China's Xiaowan hydroelectric power station succeeds" (<https://web.archive.org/web/20080619204038/http://www.karen.org/news2/messages/244.html>) . Xinhua. 2004-10-29. Archived from [the original](http://www.karen.org/news2/messages/244.html) (<http://www.karen.org/news2/messages/244.html>) on 2008-06-19. Retrieved 2008-11-09.
5. "Dam the consequences" (<https://www.theguardian.com/world/2007/apr/06/outlook.development>) . *The Guardian*. 2007-04-06. Retrieved 2008-11-09.
6. Chun, Zouli. "The world's highest dam - Xiaowan Concrete arch dam" (<https://web.archive.org/web/20111002200008/http://www.cws.net.cn/Journal/slxb/20009z/08.html>) (in Chinese). National Power Company, Kunming Investigation and Design Institute. Archived from [the original](http://www.cws.net.cn/Journal/slxb/20009z/08.html) (<http://www.cws.net.cn/Journal/slxb/20009z/08.html>) on 2011-10-02. Retrieved 2011-05-07. {{cite journal}}: Cite journal requires |journal= (help)
7. "Photos: Yunnan Xiaowan cap into the world's highest arch dam (2)" (<https://web.archive.org/web/20170404043245/http://energy.people.com.cn/GB/11117254.html>) . *Beijing Times* (in Chinese). 10 Mar 2011. Archived from [the original](http://energy.people.com.cn/GB/11117254.html) (<http://energy.people.com.cn/GB/11117254.html>) on 4 April 2017. Retrieved 7 May 2011.
8. "Huaneng 6 Xiaowan all production units" (<https://web.archive.org/web/20120426085450/http://www.hnkcj.cn/shownews.asp?newsid=2069>) (in Chinese). Huaneng Lancang River

Spillway type	Crest/tunnel
Spillway capacity	10,014 m ³ /s (353,641 cu ft/s) Flood discharge (all outlets): 20,709 m ³ /s (731,331 cu ft/s)
Reservoir	
Total capacity	15,043,000,000 m ³ (12,196,000 acre·ft)
Active capacity	9,895,000,000 m ³ (8,022,000 acre·ft)
Catchment area	113,300 km ² (43,700 sq mi)
Surface area	190 km ² (73 sq mi)
Normal elevation	1,240 m (4,068 ft) ^[2]
Power Station	
Operator(s)	Huaneng
Commission date	2009-2010
Hydraulic head	251 m (823 ft) (max)
Turbines	6 × 700 MW Francis-type
Installed capacity	4,200 MW

Hydropower Co. Archived from [the original \(http://www.hnlgj.cn/shownews.asp?newsid=2069\)](http://www.hnlgj.cn/shownews.asp?newsid=2069) on 26 April 2012. Retrieved 2 January 2012.